

**REMARKS**

The additional amendments to the specification have been made merely to insure consistency with the Examiner's Amendment that accompanied the Notice of Allowance. In addition, please note that the Examiner's change to claim 19, indicated at page 16, line 10, should read "line 11."

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page(s) is captioned "**Version With Markings To Show Changes Made.**"

Respectfully submitted,

**NIXON & VANDERHYE P.C.**

By: 

Michael J. Keenan  
Reg. No. 32,106

MJK:ljb  
1100 North Glebe Road, 8th Floor  
Arlington, VA 22201-4714  
Telephone: (703) 816-4000  
Facsimile: (703) 816-4100

**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE SPECIFICATION**

The paragraph beginning at page 2, line 2:

Accordingly, the present invention is directed to a bypass air injection apparatus and method to compensate for the degradation of a catalytic reactor and to increase combustor efficiency by extracting compressor discharge air prior to its entry into a combustion or reaction zone of the combustor, and re-injecting the extracted compressor discharge air into the combustor bypassing the catalytic reactor using a plurality of injection tubes located substantially in a common [axial] radial plane with an injection manifold. Compressor discharge air is received by the combustor in a first combustion chamber through a passageway, preferably an annulus defined between a combustor body with an inner liner and a casing enclosing the body. The first combustion chamber includes a pre-burner stage where fuel is mixed with compressor discharge air for combustion, thus raising the temperature of the hot gases sufficiently to sustain a reaction with the catalyst disposed downstream of the first combustion chamber. Hot gases flowing out of the first combustion chamber pass through a main fuel premixer (MFP) assembly for combustion in a main combustion chamber disposed downstream of the catalyst.

The paragraph beginning at page 2, line 25:

A predetermined amount of compressor discharge air, flowing through the annulus, and prior to reception in the first combustion chamber, is extracted into a manifold. The extraction manifold is disposed adjacent to an array of openings located in the casing enabling compressor discharge air to flow from the annulus into the extraction manifold. A bypass conduit connects the extraction manifold to an injection manifold. The injection manifold lies in communication with a plurality of injection tubes for injecting the extracted air into the combustor body bypassing the catalyst. As noted above, each injection tube and the injection manifold are disposed in a substantially common [axial] radial plane. Removable flange covers are provided on the injection manifold in substantial radial alignment with the respective injector tubes affording access to the tubes. The injection tubes are installed from the outside of the injection manifold at circumferentially spaced locations about the casing and the liner through flange covers. A bypass air(i.e., extracted air) path is therefore provided to bridge the backside cooling airflow annulus disposed between the combustor casing and the combustion liner.

The paragraph beginning at page 3, line 23:

In one aspect, the present invention provides a combustor for a gas turbine having a combustor body with an inner liner; a casing enclosing the body and defining a passageway therebetween for carrying compressor discharge air; a combustion chamber within the body for combustion of fuel and air; a first manifold for extracting a predetermined amount of compressor discharge air from the passageway; a second

manifold for receiving the extracted air and supplying the extracted air into the body at a location bypassing the combustion chamber; and a plurality of injection tubes in communication with the second manifold for injecting the extracted air into the body to quench combustion, the injection tubes and the second manifold being disposed in a substantially common [axial] radial plane. The combustor further includes an array of openings disposed in the casing to permit the compressor discharge air to flow through the openings into the first manifold; and a conduit for supplying the extracted air from the first manifold to the second manifold. The second manifold preferably includes an access flange for each of the injection tubes. Preferably, the injection tubes are equally spaced from one another about the second manifold. The first and second ends of the conduit terminate in the first and second manifolds, respectively. The conduit includes a control valve to regulate air flowing from the first manifold to the second manifold. The first and second manifolds are preferably disposed about an outer surface of the casing.

The paragraph beginning at page 4, line 22:

In another aspect, the present invention provides a combustor for a gas turbine including a combustor body with an inner liner; a casing enclosing the body and defining a passageway therebetween for carrying compressor discharge air; a catalytic reactor disposed in the body for controlling pollutants released during combustion; a first manifold for extracting a predetermined amount of compressor discharge air from the passageway; a second manifold for receiving the extracted air and supplying the extracted air to the body at a location bypassing the catalytic reactor; and a plurality of injection

tubes in communication with the second manifold for injecting the extracted air into the body, the injection tubes and the second manifold being disposed in a substantially common [axial] radial plane.

The paragraph beginning at page 5, line 6:

In another aspect, the present invention provides a gas turbine having a compressor section for pressurizing air; a combustor for receiving the pressurized air; and a turbine section for receiving hot gases of combustion from the combustor, the combustor including a combustor body with an inner liner, a casing enclosing the body and defining a passageway therebetween for carrying compressor discharge air, a combustion chamber within the body for combustion of fuel and air, a first manifold for extracting a predetermined amount of compressor discharge air from the passageway, a second manifold for receiving the extracted air and supplying the extracted air into the body at a location bypassing the combustion chamber, and a plurality of injection tubes in communication with the second manifold for injecting the extracted air to the body to quench combustion, the injection tubes and the second manifold are disposed in a substantially common [axial] radial plane.

The paragraph beginning at page 5, line 24:

In yet another aspect, the present invention provides a method for quenching combustion by extracting a predetermined amount of compressor discharge air, before the air flows into the reactor, from the passageway into the first manifold; supplying the

extracted air from the first manifold to the second manifold via the conduit; injecting the extracted air received by the second manifold into the body at a location along the body bypassing the reactor using an array of injection tubes; and disposing the injection tubes and the second manifold in a substantially common [axial] radial plane.